CIA/PB 131632-43 UNCLASSIFIED- SOVIET BLOC INTERNATIONAL GEOPHYSICAL YEAR INFORMATION

DECEMBER 5 1958

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PB 131632-43

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December 5, 1958

U. S. DEPARTMENT OF COMMERCE
Office of Technical Services
Washington 25, D. C.

Published Weekly from February 14, 1958, to January 2, 1959
Subscription Price $10.00 for the Series

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I. GENERAL

Czechoslovak Activities Under the IGY Program

A few additional details of the work Czechoslovakian scientists under the IGY program were revealed by Iozef Novak, Academician, chairman of the Czechoslovak Committee for the Conduct of the IGY, while attending the Fifth CSAGI Assembly in Moscow.

Czechoslovak astronomers, along with their colleagues in other countries, are conducting extensive observations of the geophysical phenomena which are closely connected with solar activity. Daily, at intervals of several minutes, eruptions on the Sun in the rays of the H_2 hydrogen line are studied, and their area and location are measured. Whole series of photographs recorded the details of rather large prominences. Six stations are especially engaged in the survey of sunspots. Here, solar noises, etc., are registered by means of radio telescopes.

A great deal of attention is also given to the measurement of the illumination of the night sky. A special instrument equipped with a photoelectric cell was built according to a design developed by Czech scientists. Two such instruments, one of which was installed in Ondrejov near Prague, and the other, at an altitude of 2,634 meters on Lomnicky Stit, in Slovakia, were used to obtain 40,000 such measurements.

The different phenomena arising in the upper layers of the atmosphere in connection with abrupt intensifications of solar activity are also studied. Ionospheric whistling is of particular interest and is recorded on magnetic tapes at special stations. Czechoslovak stations engage in the mutual exchange of these data with scientists of other countries.

Czechoslovak participation in the IGY, said Novak, is by no means limited to the investigation of the Sun. Czechoslovak scientists work in almost all disciplines of the IGY program. Important results were obtained, for example, in the field of seismology. In southern Slovakia, there is an active seismic region. A new Central Seismic Station was organized there during the IGY. It is equipped with particularly sensitive seismographs, with the aid of which it is possible to fix subterranean shocks all over the world.

Systems of sensitive horizontal pendulums are used for measuring oscillations of the Earth's crust. The pendulums' movements are automatically recorded and the minutest oscillations of the Earth's crust are determined by means of a special statistical method based on the obtained data. Such measurements are conducted near the city of Pribram, in the Vojtech mine at a depth of 1,000 meters, and in the Anna mine at a depth of 3,000 meters.

One of the most important problems of the IGY is the study of terrestrial magnetism and for this purpose, a station at Budkov in southern Bohemia was organized. Here, rapid variations of the Earth's magnetic field are recorded, and even measurements of surface (telluric) currents are taken.

Czechoslovak meteorologists carry out extensive groundwork in weather observations. Using radiosondes, they measure the pressure in the upper layers of the atmosphere and the temperature and humidity of the air. A great deal of attention is devoted to the decomposition of ozone in the atmosphere. Chemical analyses of rainfalls are conducted at two stations located at different altitudes above sea level. Measurements on the radioactivity of the atmosphere are carried out.

Finally, in regard to the launching of artificial earth satellites, 16 stations scattered throughout the country are now observing Sputnik III. Particularly good results have been obtained in the Astronomical Observatory of the Slovak Academy of Sciences at Skalny Stol. The high-altitude of the location and the favorable weather conditions here make it possible to make numerous measurements and to capture the passages of the satellite on film. Up to now, about 1,000 observations have been made. Czechoslovak scientific workers have obtained more precise data on the flattening of the Earth through the second Soviet satellite.

Two stations are engaged in the study of cosmic radiation. These are in Prague and Lominicky Stit. For measuring the intensity of the meson components of this radiation, the so-called cubic telescope is used. The instrument is equipped with Czechoslovak-made counters and Polish instruments. Secondary components are measured with the aid of a monitor equipped with Soviet counters. Novak said he was glad to report that in the very near future, Czechoslovak scientists would begin extensive measurements of cosmic radiation using a powerful ionization chamber donated by Soviet scientists. This valuable gift, said Novak, is one of the many facts expressing the strong and fruitful collaboration of Soviet and Czechoslovak science.

This association between the scientists of the two countries is considered of great value. Because of it Antonin Mrcos, Czechoslovak geophysicist, was invited to the Soviet Antarctic station of Mirnyy, where he has the opportunity to conduct astronomical and meteorological observations. ("A Thousand Observations of the Soviet Artificial Earth Satellite", by I. Novak, Academician, chairman of the Czechoslovak Committee for the Conduct of the IGY; Moscow, Nauka i Zhizn', No 10, Oct 58, pp 8-9)

II. ROCKETS AND ARTIFICIAL EARTH SATELLITES

Soviet Materials for Overcoming Thermal Barrier Discussed

An article dealing with a general discussion of materials and the surface heating of high-speed aircraft and rockets gives the following information:

Although the literature widely recommends new materials on an aluminum and titanium basis with improved mechanical properties at elevated temperatures, the strength of such materials is not satisfactory. Many suggest methods of cooling or insulating during flight, but this adds to the weight of the rocket or aircraft.

An ideal material would be one with a zero coefficient of linear expansion. In principle, it is possible to produce alloys with a low coefficient of linear expansion; for example, an admixture of 43 percent nickel to steel reduces the coefficient of linear expansion by a factor of two and this value is retained up to a temperature of 430° Centigrade.

Chemistry is also affording new solutions. Some modern plastics retain their strength at temperatures of from minus 50 to plus 170 degrees, and even higher. They are only half as heavy as aluminum and from 1/5th to 1/8th as heavy as steel. Some of them are even stronger than steel and may be used successfully in the manufacture of rocket and aircraft engines. Some plastics are only 1/10th as heavy as cork and have high heat-insulating and soundproofing properties, so important to aviation engineering.

The glass panels and canopies of aircraft cabins can easily be replaced by polycarbonates, which can be used within wide temperature ranges. There is also interest in plastics reinforced with glass fabric or glass fibers, which are 2/3 as heavy as duraluminum, 2/9 as heavy as steel, and just as strong as nonferrous metals and alloys.

By means of a brief heat treatment, closely packed sheets of glass fabric, or glass mats, impregnated with resin can easily be fashioned into large-scale sections for aircraft construction.

The plastic "Ftoroplast-4" (fluoroplast-4) is distinguished by its high-temperature stability. Parts made of this material may be used within a temperature range of approximately minus 200° Centigrade to plus 250° Centigrade. It may also be used in the manufacture of heat-resistant varnishes which remain unchanged even when heated up to 400° Centigrade.

In the Tu-104 aircraft there are 120,000 different parts made of plastic, organic glass, and their combinations with other materials. ("One of the Problems of the Thermal Barrier," by S. N. Kan; Moscow, Vestnik Vozdushnogo Flota, No 7, Jul 58, pp 56-61)

East German Artificial Earth Satellite Observation Service

An article on the orbits of near satellites and the visual observation of satellites gives the following information:

The USSR built, for its own use and that of many foreign stations, a series of telescopes (type AT-1) with an 11-degree visual-field diameter. East Germany was given 60 of these telescopes at the end of 1957.

In Potsdam, an easily manipulated, mounted Tachar camera with an aperture ratio of 1 : 1.5 and a focal length of 25 cm is used for taking series photographs of satellites during passage. As a film holder, an Exakta-Varex camera is used, the shutter release of which electrically activates the angle-recording needle of a high-speed chronograph. As many as 12-15 photographs have been taken of Sputnik II during a single passage. Since the apparent brightness of satellites varies between a stellar magnitude of minus one and plus eight, successful photographs cannot be expected, especially in the case of bright twilight-dawn, mist, and clouds. Thus a visual measuring instrument such as a theodolite, but with a wide-angle telescope, is needed. In a newly developed visual measuring apparatus at Potsdam, the position of the dials is recorded on wax paper disks by electromagnetically activated needles. The null points of the azimuth and altitude angle recordings are produced before or after the passage by sighting a culminating fixed star. The recording disks are admeasured in rectangular coordinates with a gauge plate immediately after the observation. The azimuths and altitudes are obtained after a simple calculation. With a little practice, up to 50 recordings "aimings") can be made during a single 8-minute passage, provided the satellite is observed as early as possible in its rise. The average position errors with this apparatus amount to plus-minus 3' in each coordinate, the greatest part of which is due to a sighting error. The accuracy could be improved through greater magnification (better tracking, possibly by electrically controllable drive for the telescope axis).

Since 1 February 1958, an East German satellite observation service has been operating with a network of nine stations (Kuehlungsborn, Babelsberg, Treptow, Potsdam, Eilenburg, Jena, Ilmenau, Rodewisch/Vgtl, and Sonneberg), each of which is equipped with five Soviet AT-1 telescopes and one Zeiss Astrokamera. These stations became acquainted with satellite observation techniques during the orbiting of Sputnik II.

The article includes also a tabulation of various types of satellite orbits for initial altitudes of 200, 500, and 1,000 km; a plotting of the visual conditions of two successive passages of Sputnik II on 20 January 1958 over the Central European station network; a tabulation of the westward deviation of satellite (Sputniks I, II, III, Explorer I and II) orbits of various periods for Berlin; an illustration of the graduation in the visual field of the Soviet AT-1 satellite telescope; a plotting of the height above the horizon, the azimuth, and the height at passage of Sputnik II on 24 January 1958, based on photographic observations of the Jena and Potsdam stations. ("Orbital Motion and Optical Observation of Artificial Satellites," by U. Guentzel-Lingner, Potsdam Astrophysical Observatory; Berlin, Vermessungstechnik, No 8, Aug 58, pp 173-179)

Six-Month Anniversary of Sputnik III Launching

An article in 15 November Pravda notes the end of 6 months since the launching of Sputnik III. During this time, the orbital period of Sputnik III has decreased from 105.95 minutes to 103.02 minutes, that is by 2.93 minutes, and the apogee altitude has decreased by 276 kilometers, being now equal to 1,604 kilometers. At 1800 hours Moscow time, on 15 November, Sputnik III completed 2,526 revolutions around the Earth.

A considerably greater change has occurred in the data of the carrier-rocket's orbit. During this same time, its orbital period has decreased by 12 minutes and now is 93.8 minutes, and its apogee altitude has decreased by 1,155 kilometers, being now equal to 725 kilometers. The carrier-rocket has completed 88 more revolutions than the satellite itself.

The "Mayak" radio transmitter continues to send signals on the 20.005 megacycle frequency. Solar batteries are its principal source of power.

The article reports the great interest which exists in cosmic flights and the great number of letters received from within the USSR and from abroad, many of which express the writers' desire of being the first space traveler. ("Six Months Around the Earth"; Moscow, Pravda, 15 Nov 58, p 4).

Possible Soviet Use of Artificial Earth Satellite as TV Relay Station

According to Aftenposten's correspondent in Larvik (a town on the south coast of Norway), Kaare Pettersen, television broadcasts are being received in Larvik of such a nature as to indicate that they may reach the receiving sets via a relay station placed in a Soviet artificial earth satellite.

The correspondent, who has been watching the broadcasts on his own set, reports that they always appear on channel II, are twice repeated at 0830, 0930, and 1230 hours, and are of varying strength, increasing to a maximum, then decreasing. No sound accompanies the pictures received, which are of poor quality. Up to five "ghosts" appear at times on the screen, which is not the case with other Soviet transmissions received in Larvik. For reception of the broadcasts, the antenna must be turned toward the west, also contrary to what is the case with other Soviet broadcasts. Test patterns and letters of the Cyrillic alphabet appear between the two short films shown in the program. (From an article, "Are the Russians Broadcasting Television Using Sputnik as a Relay?"; Oslo, Aftenposten ((AM edition)), 10 Nov 58, p 16)

Mysterious Lights and Rocket-Like Objects Observed Over Finland

A Finnish newspaper carries a report from Oulu, dated 13 November, telling of a mysterious light which was observed in the sky over Taivalkoski early on 12 November. A rocket-like object, reddish in color, was observed by several persons at midnight in Tyrajarvi. The light phenomenon was also observed in Oulu for some time. The local population of Oulu had observed strange lights in the sky on several occasions earlier this fall. ("Mysterious Light in the Sky"; Helsinki, Hufvudstadsbladet, 14 Nov 58)

III. UPPER ATMOSPHERE

Photographic Observations of Meteors at Ashkhabad in August 1955

The following is a full translation of an article describing the photographic observations of meteors at Ashkahabad in August of 1955.

Photographic observations of meteors conducted in the Astrophysical Laboratory of the Institute of Physics and Geophysics, Academy of Sciences Turkmen SSR, in August 1955 are described. The results of the processing of four base photographs of meteors are given.

Photographic observations of the meteors were conducted by the Astrophysical Laboratory at two points on 11 and 12 August 1955: the first point, the Astrophysical Laboratory itself ($\lambda = 58^\circ 20'.7$ = 3 hours 53 minutes 23 seconds W longitude, and $\varphi = 37^\circ 57'.5$ N latitude, $H = 226$ meters); and the second point, the base station ($\lambda = 58^\circ 06'.5$ = 3 hours 52 minutes 26 seconds W longitude, and $\varphi = 37^\circ 57.\ 0$ N latitude, $H = 600$ meters). The distance between the observation points (base line) is 20.80 kilometers, and the azimuth of the base line is taken as $87^\circ\ 38'.8$. Work was conducted under the general supervision of I. S. Astapovich.

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Observations were conducted for 6 hours on the nights of 11 and 12 and 12 and 13 August, from 2200 to 0400 Ashkhabad official time; on 13 and 14 August for 5 hours, from 2300 to 0400; and for the remainder of the nights for 4 hours, from 0000 to 0400 hours. Observations were not conducted for the nights 16 and 17 and 17 and 18 August, because of to cloudy weather. The duration of one exposure was one hour.

The photographing of meteors at each point was performed with four fixed-mount cameras with "Uran-9" objectives (lens -1:2.5; focal length, 25 centimeters; frame size, 18 by 24 centimeters). At the base point, the cameras were inclined at a magnitude of parallactic shift so that they overlapped the same region of the atmosphere as covered by the first point, for a height of 80-100 kilometers.

At the first point, the operation of a four-bladed obturator covered the camera objectives 43 times per second. Each blade was in the form of a sector with the angle at the apex equal to 90 degrees. The cameras at each point were automatically operated by means of a specially-designed control panel produced under the direction of V. A. Filimonikh in the Astrophysical laboratory. This meteor patrol was designated as MP-9.

During the indicated period, 19 photographs of meteors were made at the first point (Keshi), and 48 at the second point; 19 meteors were photographed simultaneously at the two points.

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Thus the design of the MP-9 proved itself and was later used as the basis for the production of the AS-11 (MP-11) standard automatic station in 1957.

The smaller number of photographs at the first point is explained by the fact that the lens there was covered by the blades of the obturator and therefore the active exposure time was decreased by half and consisted of half an hour. This period of time proved to be insufficient to overcome the threshold of inertia of the emulsion. When two corresponding negatives from the first and second points were compared, it was apparent that the negatives from the second point have a normal image density (gray background), and in the first point, are underexposed -- completely transparent. Thus, faint meteors were well-defined on negatives of the second point, while on negatives of the first point, they could not be seen. In addition to this, in the case of basic meteors the meteor image was weaker in first point negatives than in second point negatives. At the second point, meteors weaker by one stellar magnitude could be photographed. From a comparison with A. P. Savrukhin's visual observations the weakest of these had a brightness of zero magnitude (the fast-moving Perseid meteor shower). All this leads to the conclusion that in the selection of exposure time, it is certainly necessary to take into consideration the total time the objective is covered by the rotating shutter.

Of the 19 base photographs it was possible to develop only 10. The remainder were impossible to process due to the weakness of the meteor images, the absence of reference stars near the images, etc.

Measurement of the negatives was done on the UIM-21 universal measuring microscope with 0.001 millimeter graduations of the micrometric scale. Readings were taken by eye in the above arrangement. Three observations were taken for each point.

Table 1

Meteor	Breaks for Stars (n, mm)	Ends of Meteor Trail Segments (n, mm)	Distance of the Meteor From Center of Negative (mm)
1	±0.0039 (90)	±0.035 (108)	85-98
	±0.0031 (75)		87-89
2	±0.0028 (141)	±0.023 (105)	15-45
	±0.0021 (108)		6-30

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Meteor	Breaks for Stars (n, mm)	Ends of Meteor Trail Segments (n, mm)	Distance of the Meteor From Center of Negative (mm)
3	±0.0035 (114)	±0.0027 (42)	53-41
	±0.0038 (120)		54-45
4	±0.0048 (78)	±0.046 (93)	36-102
	±0.0032 (144)		24-101

Table 1 gives the results of the processing of the first four meteors. The mean quadratic errors ε of one measurement are given, and the number of measurements is shown in parentheses. The first line is for negatives obtained at the first point and the second line, for negatives obtained at the base point. It can be seen that the accuracy for negatives obtained at the base point is higher than for negatives at the first point. The accuracy of the measurement of points located near the center of the negative is higher. The ends of the meteor trail segments are measured with an accuracy lower than that of the other points.

The scale of the negatives is as follows: 0.001 mm is equal to 0.8". The mean quadratic error expressed in angular measure consists of ± 2" - 4" for breaks in star trails and ± 20" - 40" for the ends of the segments of the meteor trails. The theoretical accuracy with % = 25 centimeters is 6".

The different accuracy in the measurements of the breaks for stars and the ends of the segments of the meteor trails is due to the fact that the ends of the star segments are sharper than the ends of the meteor segments. The latter are more difficult to measure.

Therefore, if the trajectory of a meteor is determined with sufficient accuracy, the value of the velocity is obtained with less precision.

The velocity of the meteor v was determined separately for each segment of the trajectory, $v = L:\gamma$, where γ is the parameter determined from the period of rotation of the obturator. The lengths of the segments of the trajectory L are proportional to the line lengths ℓ of these segments on the negatives. The measured lengths of the segments for the four meteors varied from $\ell = 0.75$ mm up to $\ell = 2.3$ mm. The mean quadratic error for ℓ consisted of ± 0.038 - ±0.065 mm. This gives ± 2-4% for a length of a segment. This means that the velocity cannot be determined with an accuracy of more than ± 2-4% with n = 1.

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A large error is introduced in the determination of the lengths of segments of a meteor trail because of the method itself which his used to photograph meteors with obturators. In the low-speed obturators used at present, the time of covering the objective with the edge of the obturator blade is of the same order as the time of full covering of the objective. When the blade covers (uncovers) the objective, then this is equivalent to the decrease (increase) of the power of the objective. If the meteor in a given part of the trajectory is rather weak then its image on the negative will disappear when the obturator blade covers, for example, the objective by one third of its diameter. If the meteor is rather bright, then its image remains even when the obturator blade covers half of the objective. In addition to this, images of the meteor's trail are superimposed on the image of its segments. Therefore, to increase the accuracy of determining the segments of the trajectory, and also the velocity of meteors, it is necessary that the very process of covering the objective with the edge of the obturator blade be very brief. This can be achieved by increasing the speed of ratation of the obturator. The meteor image on the negative will, with a higher speed of rotation, be obtained not in the form of separate segments but in the form of points. Finally, it is possible to measure more accurately the center of the points than the faded end of a segment.

All of this served as the reason for creating the MP-10 high speed patrol, which was established in Sad Keshi with n = 50 breaks per second.

In Table 2, the results of processing four meteors are given. The moment of the flight of the meteor was obtained from visual observations. If the moment of the flight of the meteor was not known, the time of the average exposure is given. In this case, the direct ascension of the radiant is given for the middle of the exposure. It was impossible to obtain the velocity for meteor 1, because the meteor was at the edge of the negative and nearby reference stars were lacking. The average velocity was determined for meteor 3. The first half of the path of meteor 4 was very weak, and it was possible to determine its velocity only for the second half of the path. Meteors 1, 2, and 3 belong to the Perseid shower.

Table 2

Meteor	Date	Moment UT	Radiant	ZR	Altitude (Km)	Velocity (Km/Sec)
1	1955 11 Aug	20h 04m 12s ---	45°1'.1 +57°32'.3	56°54'.8	104.79- -84.36	--
2	11 "	20h-21h	42°45'±' ±7°30' +56°03'.4	52°40'.0	105.40-- -91.28	58.90-- 56.50

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Meteor	Date	Moment UT	Radiant	ZR	Altitude (Km)	Velocity (Km/Sec)
3	11 Aug	20h-21h	43°01'.4± ±7°30' +57°34'.2	52°26'.4	102.64-- -92.00	57.51
4	22 "	21h-22h	260°40'.9 ±7°30' +62°46'.5	57°05'.6	84.86-- -68.11	20.89-- 16.92

("Photographic Observations of Meteors in August 1955 at Ashkhabad," by A. P. Savrukhin, Institute of Physics and Geophysics, Academy of Sciences Turkmen SSR; Ashkhabad, Izvestiya Akademii Nauk Turkmenskoy SSR, No 4, 1958, Meteornyy Byulleten', pp 116-118)

IV. ARCTIC AND ANTARCTIC

Foreign Correspondents Visit Arctic Drift Station

On 12 November 1958, a group of Soviet and foreign journalists took off on a flight to the drift station Severnyy Polyus-7. The journalists will also visit Igarka, Ostrov Dikson, and several other points of the Soviet Arctic.

The group includes correspondents of Pravda, Izvestiya, Leningradskaya Pravda, the Hsin-hua Agency (China), the Polish Press Agency, the Czechoslovak Radio, the Rumanian Press Agency, the newspapers Nepszabadsag (Hungary), Neues Deutschland (GDR), Unita (Italy), L'Humanite (France), Ny Dag (Sweden), and others.

The flight was organized at the request of foreign correspondents assigned to Moscow, who had expressed the desire to become familiar with the economic and cultural development of regions of the Far North and the scientific work of Soviet polar explorers.

On 11 November, a press conference for the journalists taking part in the flight was held in Glavsevmorput' (Main Administration of the Northern Sea Route). A. A. Afanas'yev, Deputy Minister of the Maritime Fleet and chief of Glavsevmorput', informed the correspondents regarding the travel route and other details of the flight, talked about the scientific research work being done in the Arctic, and answered questions from correspondents. ("To the North Pole," Moscow, Pravda, 12 Nov 58)

Some Results of Antarctic Research Work

Three groups of Soviet marine antarctic expeditions on the Ob' and Lena have conducted complex oceanographic research in a vast area of the Antarctic Ocean, extending from 20 degrees E to 100 degrees W. Over 400 deep-water hydrological stations were taken in this part of the ocean. Aerometeorological, hydrological, hydrochemical, biological, magnetic, and geographic observations were conducted along the entire route of the ships. In addition, extensive studies of the morphology and sedimentation of the south polar seas were made.

As a result of this work, a number of natural laws for the distribution and movement of water masses of the Antarctic Ocean were determined. Especially interesting results were obtained in the study of the current of west winds, which is the most important circulatory system of the world ocean. A strong development of current has also been determined near the coast of Antarctica, flowing from east to west. This current covers a large area and reaches considerable speed. A detailed description of the water masses of the oceanic belt surrounding the coasts of Antarctica was obtained. For this purpose, modern electromagnetic methods of measuring sea currents were widely used, which provided a great deal of new information for a quantitative description of the movement of surface waters of the southern oceanic belt.

As a result of rocket soundings of the atmosphere made during the last voyage of the Ob', data were obtained for the first time on the distribution of temperature and pressure of air in the stratosphere of East Antarctica.

The extensive materials collected by the expeditions on the geology of the sea bottom now make it possible to form new detailed concepts regarding the processes of sedimentation and the structure of the Antarctic ocean bottom.

Biological research of Soviet expeditions has disclosed the fundamental peculiarities of the Antarctic ocean fauna, has determined the changes in fauna according to latitude, and has laid the foundation for zoogeographic zoning, which has great practical importance in whale fishing.

The coastal detachments of the marine expeditions conducted geographic explorations of the antarctic coast along the whole length from Enderby Land in the west to Oates Land in the east.

On the basis of aerial photography of the coast between 40 and 166 degrees E longitude (about one third of the whole coast of Antarctica), the first reliable maps of the indicated region are being compiled, which are based on numerous astronomical points. Within the same boundaries, aeromagnetic and gravimetric research was conducted. A geological map of the ice-free areas was prepared.

The geomorphological work relating to the ocean bottom enabled scientists to determine the extremely complex structure and disjointed nature of the bottom. About 75 percent of the explored area of the bottom, between the latitudes of South Africa and Antarctica, has a volcanic relief, where individual volcanic cones with a relative elevation of up to 3,000 meters alternate with high plateaus and massifs of merged volcanoes. Huge areas are covered by lava fields with terraced, block-shaped or mound-shaped surfaces. The subantarctic islands Crozet, Prince Edward, Herd, and Kerguelen, are only the highest points of the volcanic massifs of this vast submarine land.

It is interesting to note that the explored areas of the southwest portion of the Pacific Ocean, northeast of the Ross Sea, turned out to be a deeply submerged land with extremely pronounced and complex disjunctions. The volcanic forms of the relief in this area play a less important role than in comparable latitudes of the Indian Ocean; however, in a number of cases they form typical submarine volcanic landscapes.

The coastal shelf of Antarctica was explored in detail, beginning from Davis Sea to the east. Among the most interesting features of the sea bottom is the great depth of the coastal shelf (from 400 to 700 meters, as compared with the usual 200 meters), and the existence of a very long trough on the coastal shelf, apparently encircling all of East Antarctica. The trough is up to 1,400 meters deep. The Soviet expedition was able to trace it along its whole length from Mirnyy to the Adelie Coast. ("Some Results of the Work of the Soviet Complex Antarctic Expedition," by D. I. Shcherbakov, Moscow, Vestnik Akademii Nauk SSSR, No 8, Aug 1958, pp 47-56)

Antarctic Research Continues; Arctic Institute Renamed

In an interview with a correspondent of Ogonek, Academician D. I. Shcherbakov gave answers to a number of questions.

At present, 42 scientific institutions in the USSR are engaged in processing the materials collected by polar scientists in Antarctica. This fact alone makes it necessary to coordinate all forces and to create one single supervisory agency. Therefore, the Interdepartmental Commission for the Study of the Antarctic is being formed under the Academy of Sciences USSR. In addition to institutes of the academy, this commission includes the Glavsevmorput' (Main Administration of the Northern Sea Route), the Hydrometeorological Service, and several universities. The Arctic Institute in Leningrad, which has accumulated a great deal of experience in the past 30 years in the study of polar countries, has now become the Institute of the Arctic and Antarctic.

There are essential differences between East and West Antarctica from a geological viewpoint. East Antarctica is the least explored portion of the antarctic continent and occupies about two thirds of the whole area. It represents one of the oldest formations of the Earth's crust in the form of a terraced platform raised above the ocean level. However, West Antarctica is much more recent with regard to its geological age, and serves as a sort of continuation of the folded mountain formations of the South American Andes. In accordance with these geological features, one may form conjectures regarding possible occurrences of mineral resources. In East Antarctica, which is geologically similar to South Africa, Central Australia, and Brazil, one may discover deposits of uranium, and precious and rare metals. In West Antarctica, by analogy with Venezuela and Bolivia, it is likely that there may be deposits of petroleum, copper, silver, tin, and lead ores.

Soviet geological prospecting so far has been exceedingly complicated by the fact that one had to work in regions where the rocks are buried under glaciers. In addition to geophysical observations, it will now be possible to engage in more thorough geological research. In the next few years, the regions with the largest areas of ice-free rock outcrops will be explored, i. e. Queen Maud Land on the Atlantic coast of East Antarctica and the coast of Bellingshausen Sea on the Pacific coast of West Antarctica. In these regions, it is planned to establish new Soviet scientific stations named after some of the first discoverers of Antarctica, Lazarev and Bellingshausen.

Oceanological research during the IGY has disclosed that between Antarctica, on the one side, and the southern extremities of America, Africa and Australia, on the other side, there exists a belt of submarine elevations with volcanic activity. New mountains are forming continuously in the depths of the ocean. In the distant future, i.e., many thousands of years, these mountains may appear above the surface of the ocean, as the Kurile Islands emerged above the surface at some time in the past.

Detailed observations of the bottom relief may make it possible to discover, within the boundaries of the coastal shelf (on the submarine continuation of the continent), transverse valleys formed by rivers, which at one time flowed from the antarctic continent to the ocean. Along these submarine valleys, it may be possible to reconstruct the history of the recent geological past of Antarctica.

Antarctica has never before been so "populated" as during the IGY. The successful cooperation among scientists of many nations gives the assurance that also in the future scientific explorers will be "permanent residents" of this mysterious continent and that the continent itself will finally cease to be a mystery to mankind. ("The Assault on Antarctica Continues," by Academician D. I. Shcherbakov, Moscow, Ogonek, No 45, Nov 58, p 6)

Temperature at Komsomol'skaya

The region of the Soviet station Komsomol'skaya has severe frosts, reaching minus 81° Centigrade. The mean annual temperature of the air is about minus 50° Centigrade. Interesting data have been obtained on the temperature regime of this area. Because of the extreme transparency of the atmosphere, the solar intensity is very high. On sunny days, even at temperatures of minus 40°-50° Centigrade, one may observe a slight thawing and evaporation of snow on dark objects. A great deal of information has been collected on the temperature of the snow at various levels, as well as on soundings of the free atmosphere. I. Ivanov, meteorologist, successfully conducts scientific observations. ("Today at Komsomol'skaya," Moscow, Vodnyy Transport, 7 Nov 58)

New Soviet Drifting Ice Station Reported in Arctic

From a source which regularly listens to the weather reports broadcast from the ice island stations in the Arctic Ocean, Aftenposten has received information which indicates that the USSR has established a new station, North Pole-8 [Severnyy Polyus-8]. On two separate occasions, signals have been intercepted which originated in a position where neither of the presently known Soviet stations North Pole-6 and North Pole-7 [Severnyy Polus-6 and Severnyy Polyus-7] are known to be at present. ("New Soviet Ice Island Station in the Arctic"; Oslo, Aftenposten, AM edition, 10 Nov 58, p 7)

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